

Appendix 1

Past Vegetation Management Actions within the Galton Vegetation Management Project Area

<i>Decade</i>	<i>Activity</i>	<i>Acres</i>
<i>1950-1959</i>	Intermediate Harvest	539
	Regeneration Harvest	4,459
	Prescribed Fire	0
	Wildfire	None Recorded
<i>1960-1969</i>	Intermediate Harvest	811
	Regeneration Harvest	4,982
	Prescribed Fire	0
	Wildfire	None Recorded
<i>1970-1979</i>	Intermediate Harvest	4,124
	Regeneration Harvest	1,823
	Prescribed Fire	24
	Wildfire	None Recorded
<i>1980-1989</i>	Intermediate Harvest	944
	Regeneration Harvest	1,901
	Prescribed Fire	1,206
	Wildfire	None Recorded
<i>1990-1999</i>	Intermediate Harvest	205
	Regeneration Harvest	414
	Prescribed Fire	2,859
	Wildfire	1,836
<i>2000-2009</i>	Intermediate Harvest	767
	Regeneration Harvest	104
	Prescribed Fire	1,699
	Wildfire	91
<i>2010-2015</i>	Intermediate Harvest	0
	Regeneration Harvest	0
	Prescribed Fire	0
	Wildfire	7,552

Appendix 2

INTRODUCTION

Federal agency compliance with pollution control is addressed through Section 313 of the Clean Water Act, Executive Order 12580 (January 23, 1987), National Nonpoint Source Policy (December 12, 1984), USDA Nonpoint Source Water Quality Policy (December 5, 1986) and the Environmental Protection Agency in their guidance "Nonpoint Source Controls and Water Quality Standards" (August 19, 1987). In order to comply with State and local non-point pollution controls the Forest Service will apply Best Management Practices (BMPs) to all possible non-point sources which may result from management activities proposed in this DEIS. These BMPs are the Soil and Water Conservation Practices described in the Forest Service Handbook (FSH) 2509.22.

BMPs are the primary mechanism for achievement of water quality standards (EPA, 1987). This appendix describes the Forest Service's BMP process in detail, and lists the key Soil and Water Conservation Practices that have been selected to be used in the action alternatives analyzed in this DEIS.

BMPs include, but are not limited to, structural, and non-structural controls, operations, and maintenance procedures. BMPs can be applied before, during, or after pollution-producing activities to reduce or eliminate the introduction of pollutants into the receiving watershed (40 CFR 130.2, EPA Water Quality Standards Regulation). BMPs are usually applied as a system of practices rather than a single practice. They are selected on the basis of site-specific conditions that reflect natural background conditions and political, social, economic, and technical feasibility.

The Forest Plan states that soil and water conservation practices, as outlined in the Soil and Water Conservation Practices Handbook (FSH 2509.22, May 1988), will be incorporated into all land use project plans as a principal mechanism for controlling non-point pollution sources, meeting soil and water quality goals, and protecting beneficial uses. Activities found not to comply with the soil and water conservation practices or State standards will be brought into compliance, modified, or stopped (USDA Forest Service, 2015). Montana State Water Quality Standards require the use of reasonable land, soil, and water conservation practices (analogous to BMPs) as the controlling mechanism for non-point pollution. The use of BMPs is also required in the Memorandum of Understanding between the Forest Service and the State of Montana as part of the agency's responsibility as the designated water quality management agency on National Forest System lands.

BMP IMPLEMENTATION PROCESS

In cooperation with the State, the Forest Service's primary strategy for the control of non-point sources of pollution is based on the implementation of preventive practices (i.e., BMPs). The BMPs have been designed and selected to protect the identified beneficial uses of the watershed.

The Forest Service non-point source management system consists of the following steps:

- 1) BMP Selection and Design - Water quality goals are identified in the Forest Plan. These goals meet or exceed applicable legal requirements including State water quality regulations, the Clean Water Act, and the National Forest Management Act. Environmental assessments for projects are tiered to Forest Plans using the National Environmental Policy Act process. The appropriate BMPs are selected for each project by an interdisciplinary team. In each new location, there is flexibility to design different BMPs depending on local conditions and values and

downstream beneficial uses of water. The BMP selection and design are dictated by the proposed activity, water quality objectives, soils, topography, geology, vegetation, and climate. Environmental impacts and water quality protection options are evaluated, and alternative mixes of practices are considered. A final collection of practices are selected that not only protect water quality but meet other resource needs. These final selected practices constitute the BMPs for the project.

- 2) BMP Application - The BMPs are translated into contract provisions, special use permit requirements, project plan specifications, and so forth. This insures that the operator or person responsible for applying the BMPs actually is required to do so. Site-specific BMP prescriptions are taken from plan-to-ground by a combination of project layout and resource specialists (hydrology, fisheries, soils, etc.). This is when final adjustments to fit BMP prescriptions to the site are made.
 - 3) BMP Monitoring - When the resource activity begins (e.g., timber harvest or road building), timber sale administrators, engineering representatives, resource specialists, and others insure the BMPs are implemented according to plan. BMP implementation monitoring is done before, during, and after resource activity implementation. This monitoring answers the question: Did we do what we said we were going to do? Once BMPs have been implemented, further monitoring is done to evaluate if the BMPs are effective in meeting management objectives and protecting beneficial uses. If monitoring indicates that water quality standards are not being met or beneficial uses are not being protected, corrective action will consider the following:
 - a. Is the BMP technically sound? Is it really best or is there a better practice that is technically sound and feasible to implement?
 - b. Was the BMP applied entirely as designated? Was it only partially implemented? Were personnel, equipment, funds, or training lacking which resulted in inadequate or incomplete implementation?
 - c. Do the parameters and criteria that constitute water quality standards adequately reflect human-induced changes to water quality and beneficial uses?
 - 4) Feedback - Feedback on the results of BMP evaluation is both short- and long-term in nature. Where corrective action is needed, immediate response will be undertaken. This action may include: modification of the BMP, modification of the activity, ceasing the activity, or possibly modification of the State water quality standard. Cumulative effects over the long-term may also lead to the need for possible corrective actions.
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KNF BMP SELECTION AND DESIGN FORM (KNF-BMP-1)**SITE-SPECIFIC BEST MANAGEMENT PRACTICES.**

Description of the soil and water conservation practices from the Forest Service Soil and Water Conservation Handbook (FSH 2509.22) will be applied in all alternatives. The location where the practices will be applied is specified in the table below. The number found in the percent effective column is based on results from forest plan monitoring. For a more detailed description of a specific BMP, refer to the Soil and Water Conservation Handbook.

Abbreviations used in this table:

SPS = Special Project Specification

TSC = Timber Sale Contract

TSA = Timber Sale Administrator

SMZ = Streamside Management Zone

IDT = Interdisciplinary Team

SWCP = Soil and Water Conservation Practice

KNF = Kootenai National Forest

PSF = Pre-sale Forester

ER = Engineering Representative

COR = Contracting Officer's Representative

SAM = Sale Area Map

FMO = Fire Management Officer

SWCP	SWCP OBJECTIVE	PERCENT EFFECTIVE	RECOMMENDED BEST MANAGEMENT PRACTICES BY IDT/TSA	CONSIDERATIONS FOR BEST MANAGEMENT PRACTICES	PERSON(S) RESPONSIBLE	CONTRACT PROVISIONS
14.01	TIMBER SALE PLANNING - To incorporate soil and water resource considerations into Timber Sale Planning	94%	1. Unit design, mitigation, and effects analysis was done by IDT. 2. TSC will be prepared by PSF that includes Design Criteria from the decision. 3. Use standard RHCA widths unless modified (requires documentation of rationale). 4. Use existing skid trails where feasible.	IDT has evaluated watershed characteristics and estimated response to proposed activities. EIS identifies design criteria to protect soil and water resources. Timber sale contracts will include provisions to meet water quality, soils, and other resources as directed by the Decision.	IDT; PSF	N/A
14.02	TIMBER HARVEST UNIT DESIGN - To insure that timber harvest unit design will secure favorable conditions of water flow, maintain water quality and soil productivity, and reduce soil erosion and sedimentation.	95%	1. Cumulative effects analysis and unit design were performed by IDT. 2. The prescriptions and unit design are consistent with direction outlined in the considerations for Best Management Practices. 3. Use standard RHCA widths unless modified (requires documentation of rationale). 4. Use existing skid trails where feasible. 5. Suitable logging system used for topography, soil type, and season of operation.	Proposed activities were evaluated to estimate the potential watershed response. Prescriptions will be designed to assure an acceptable level of protection for soil and water resources. Management will protect soil/water values by avoiding sensitive areas, adjusting unit boundaries, adding specific BMPs to meet specific SWCPs, applying mitigation, and applying implementation/effectiveness monitoring to trend toward desired conditions.	IDT; PSF	N/A

SWCP	SWCP OBJECTIVE	PERCENT EFFECTIVE	RECOMMENDED BEST MANAGEMENT PRACTICES BY IDT/TSA	CONSIDERATIONS FOR BEST MANAGEMENT PRACTICES	PERSON(S) RESPONSIBLE	CONTRACT PROVISIONS
14.03	USE OF SALE AREA MAPS (SAMs) FOR DESIGNATING SOIL AND WATER PROTECTION NEEDS - To delineate the location of protected areas and available water sources and insure their recognition, proper consideration, and protection on the ground.	93%	<ol style="list-style-type: none"> 1. Water courses identified and protected using RHCA/SMZ buffers as a minimum. 2. Skidding on dry, frozen, or snow-covered soil conditions. 3. Designated skid trails in units with previous harvest. 4. Use standard RHCA widths unless modified (requires documentation of rationale). 	The IDT will identify water courses to be protected, unit boundaries, and other features required by other means such as "C" provisions. Ground verification and preparation of SAMs to be included in TSC will be done by PSF. TSA reviews areas of concern with purchaser before operations.	IDT; PSF; TSA	B(T)1.1 B(T)6.5 C(T)6.50#
14.04	LIMITING THE OPERATION PERIOD OF TIMBER SALE ACTIVITIES - To minimize soil erosion, sedimentation, and a loss in soil productivity by insuring that the purchaser conducts his/her operations in a timely manner.	99%	<ol style="list-style-type: none"> 1. Units located on soils sensitive to compaction and/or displacement has been identified. 2. Designate units needing harvest on frozen or snow covered ground. 3. All other ground disturbing activities will occur during dry, frozen, or snow-covered conditions to minimize soil compaction and displacement. 	If limited operating periods are identified and recommended during the analysis by the IDT, the PSF will prepare a contract that includes provision C(T)6.316 and/or C(T)6.4#.	IDT; PSF; TSA	B(T)6.31 B(T)6.311 B(T)6.6 C(T)6.6 C(T)6.316# C(T)6.4#
14.05	PROTECTION OF UNSTABLE AREAS - To protect unstable areas and avoid triggering mass movements of the soil mantle and resultant erosion and sedimentation.	96%	<ol style="list-style-type: none"> 1. Unstable landtypes will be identified during the planning process. 2. Units found to need further protection will use alternative yarding techniques, seasonal restrictions, and/or unit boundary adjustments. 	If the NEPA analysis concluded that soils/geology in the area were unstable, then BMPs are designed to prevent irreversible soil and water damage.	IDT; PSF; TSA	C(T)6.4#
14.06	RIPARIAN AREA DESIGNATION - To minimize the adverse effects on riparian areas with prescriptions that manage nearby logging and related land disturbance activities.	90%	<ol style="list-style-type: none"> 1. Identify areas with or adjacent to wet areas. 2. Default RHCA widths will be adhered to unless modified (requires documentation of rationale).. 3. SMZ widths will be used as a minimum if modification is proposed. 4. Areas found during sale layout will be reported to the Hydrologist and afforded the same protections as those identified during the planning process. 	All activities near streams and wetlands in the decision area will comply with the 2015 KNF Forest Plan and the SMZ law (HB-731). These widths will be included on the sale area map and marked on the ground.	IDT; PSF; TSA	B(T)1.1 B(T)6.5, C(T)6.4# C(T)6.41# C(T)6.50#
14.07	DETERMINING TRACTOR-LOGGABLE GROUND - To protect water quality from degradation caused by tractor logging ground disturbance.	97%	<ol style="list-style-type: none"> 1. Avoid tractor logging on unstable slopes and slopes greater than 40% (small areas of the unit may have slopes > 40%). 2. Those areas found not to be tractor logged were designated as cable, forwarder, or winter harvest units; or were dropped from the unit. 	IDT has identified tractor-loggable ground (in conjunction with personnel from timber operations) during transportation and timber sale planning process. The results have been used to determine intensity of and restrictions for land disturbance activities. PSF will prepare a TSC that includes provisions stating areas and conditions under which tractors can operate.	IDT; PSF	C(T)6.4# SAM
14.08	TRACTOR SKIDDING DESIGN - To minimize erosion and sedimentation and protect soil productivity by designing skidding patterns to best fit the terrain.	97%	<ol style="list-style-type: none"> 1. Identify units with designated or dispersed skid trails. 2. TSA and purchaser agree on proposed locations before operation. 3. Skidding operation minimizes soil displacement and compaction. 	IDT has identified sensitive areas during the planning process. The TSA will execute the plan on the ground by locating the skid trails with the timber purchaser or by agreeing to the purchaser's proposed locations prior to operation.	IDT; PSF; TSA	B(T)6.422 C(T)6.4#

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14.09	SUSPENDED LOG YARDING IN TIMBER HARVESTING - To protect the soil from excessive disturbance and accelerated erosion and maintain the integrity of the riparian areas and other sensitive areas.	95%.	<ol style="list-style-type: none"> 1. Units that have slopes that are unsuitable for or sensitive to ground base skidding will be identified during analysis and listed in the Design Criteria. 2. Units with sustained slopes >40% will be designated cable harvest units. 	IDT recognizes the hazards associated with operating on steep and/or rocky slopes. Areas found to be of concern will use appropriate harvest systems that provide for a safe work environment and protect natural resources.	IDT; PSF	B(T)6.42 C(T)6.4# C(T)6.50#
14.10	LOG LANDING LOCATION AND DESIGN - To locate in such a way as to avoid soil erosion and water quality degradation.	99%	<ol style="list-style-type: none"> 1. TSA and purchaser agree on landing locations before operation. 2. Suitable number, size, and location of landings. Use least excavation needed. 3. No side-cast material into sensitive areas or waterways. 4. Install proper drainage. 	TSA must agree to landing locations proposed by the purchaser. Approved landing locations will meet the criteria of: minimal size, least excavation needed, minimum skid roads necessary, no side-cast material into sensitive areas, and have proper drainage.	PSF; TSA	B(T)6.422 C(T)6.422
14.11	LOG LANDING EROSION PREVENTION AND CONTROL- To reduce erosion and subsequent sedimentation from log landing through the use of mitigating measures.	98%	<ol style="list-style-type: none"> 1. Proper drainage will be installed and maintained during operation. 2. Landings will be scarified, seeded, and fertilized upon completion harvest activities. 3. TSA will assess conditions and take necessary steps to insure soil and water protection. 	PSF and TSA assess what is necessary to prevent erosion from landing and to insure stabilization. It is up to the TSA to request technical assistance as needed.	PSF; TSA	C(T)6.6 BT6.64 B(T)6.6 C(T)6.633#
14.12	EROSION PREVENTION AND CONTROL MEASURES DURING THE TIMBER SALE OPERATION - To insure that the purchaser's operations shall be conducted reasonably to minimize soil erosion.	91%	<ol style="list-style-type: none"> 1. Designate units with seasonal restrictions. 2. Do not operate during wet periods including spring-snowmelt and/or intense or long-duration rain storms. 3. TSA insures that erosion control is kept current and prevents operation when excessive impacts are possible. 	PSF and TSA sets purchaser's responsibility to prevent soil/water resource damage in TSC. TSA insures that erosion control is kept current and prevents operation when excessive impacts are possible.	PSF; TSA	A13 B(T)6.6 B(T)6.64 C(T)6.6 C(T)6.601# C(T)6.633#
14.13	SPECIAL EROSION PREVENTION MEASURES ON AREAS DISTURBED BY HARVEST ACTIVITIES - To prevent erosion and sedimentation on disturbed areas.	93%	<ol style="list-style-type: none"> 1. Waterbar, seed, fertilizer, and place woody debris on skid trails, landings. 2. Recontour, seed, and place woody debris on constructed skid trails and temporary roads. 3. BMPs may be adjusted by the TSA to meet operational requirements 	IDT identifies locations needing special stabilization measures. If any such areas are identified, BMPs may be adjusted by the TSA to meet operational requirements	IDT; PSF; TSA	C(T)6.601# C(T)6.32# C(T)6.633#
14.14	REVEGETATION OF AREAS DISTURBED BY HARVEST ACTIVITIES - To establish a vegetative cover on disturbed areas to prevent erosion and sedimentation.	95%	<ol style="list-style-type: none"> 1. Seed and fertilize areas of exposed soil with KNF approved seed and fertilizer mix. 2. Disturbed areas covered with slash and/or mulch as necessary. 	The KNF has established vegetation and fertilizer mix to be used in the project area with outlines on the extent to which it should be used. TSA is responsible for seeing that revegetation work required by purchaser is done correctly and in a timely manner. The purchaser will be responsible for revegetation immediately after the completion of harvest. Funds will be collected for the District to do follow-up seeding/fertilizing in years two and three after harvest.	IDT; TSA	C(T)6.01# C(T)6.633#

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14.15	EROSION CONTROL ON SKID TRAILS - To protect water quality by minimizing erosion and sedimentation derived from skid trails.	89%	<ol style="list-style-type: none"> 1. Insure proper skid trail location. 2. Insure proper drainage on skid trails; avoid concentrating runoff. 3. Recontour, seed, and place woody debris on constructed skid trails and temporary roads. 4. Insure maintenance of erosion control structures by purchaser. 5. Adequate erosion control on temporary roads, skid trails, and harvest-disturbed areas within the unit. 	Erosion control measures may be recommended by the IDT, but site-specifically adjusted by the TSA. TSA will insure erosion control measures are applied prior to expected hydrologic events (spring runoff, high-intensity storms, etc.). Maintenance of erosion control structures by the purchaser may be necessary and requested by the TSA.	TSA	C(T)6.6 C(T)6.633# B(T)6.6 B(T)6.65 B(T)6.66
14.16	WET MEADOW PROTECTION DURING TIMBER HARVESTING - To avoid damage to the ground cover, soil, and water in meadows.	87%	<ol style="list-style-type: none"> 1. Units with, or adjacent to, wet meadows, wetlands, and/or ponds will have buffers clearly identified in the sale map and on the ground. 2. Units with unmapped wet areas will be reported to Hydrologist and afforded the same protection as those identified during the planning process. 3. Standard RHCA widths will be adhered to unless modification is in place. 4. The SMZ law will be met or exceeded. 	IDT has identified areas needing special protection. PSF will verify the areas needing protection and prepare the contract to prevent damage to meadows. The TSA will be responsible for on-the-ground protection of meadows. If meadows are found by the TSA during operations, it is their responsibility to either afford them the proper protection or pursue a contract modification.	IDT; PSF; TSA	B(T)1.1 B(T)5.1 B(T)6.422 B(T)6.61 C(T)6.4# C(T)6.62#
14.17	STREAM CHANNEL PROTECTION (IMPLEMENTATION AND ENFORCEMENT) - Protect natural stream flows; provide unobstructed passage of flows; reduce sediment input; and restore flow if diverted by timber sale activity.	92%	<ol style="list-style-type: none"> 1. Standard RHCA widths will be adhered to unless modification is in place. 2. SMZ widths will be used at a minimum if modification in place. 3. SMZ law will be met or exceeded. 	IDT has identified the location of channels in the decision area. PSF will prepare a SAM locating the channels needing protection. Layout crew marks boundaries and trees according to HB-731. TSA will see that TSC items are carried out on the ground. Technical assistance will be consulted as needed.	IDT; PSF; TSA	B(T)1.1 B(T)6.5 B(T)6.6 C(T)6.50# C(T)6.6
14.18	EROSION CONTROL STRUCTURE MAINTENANCE - To insure that constructed erosion control structures are stabilized and working effectively.	92%	<ol style="list-style-type: none"> 1. During the period of the TSC, the purchaser is responsible for maintaining their erosion control features. 	During the period of the TSC, the purchaser is responsible for maintaining their erosion control features. If work is needed beyond this time, the District will pursue other sources of funding.	IDT; PSF; TSA	B(T)6.66 B(T)6.67
14.19	ACCEPTANCE OF TIMBER SALE EROSION CONTROL MEASURES BEFORE SALE CLOSURE - To assure the adequacy of required erosion control work on timber sales.	97%	<ol style="list-style-type: none"> 1. TSA reviews erosion prevention work before each harvest unit is considered complete. 2. The inspection will determine if the work is acceptable and will meet the objective of the erosion control feature. 	A careful review of erosion prevention work will be made by the TSA before each harvest unit is considered complete. The inspection will determine if the work is acceptable and will meet the objective of the erosion control feature. A feature is considered not acceptable if it does not meet standards or is not expected to protect soil/water values. Technical assistance will be used as necessary.	TSA	B(T)6.36
14.20	SLASH TREATMENT IN SENSITIVE AREAS - To protect water quality by protecting sensitive tributary areas from degradation that would result from using mechanized equipment for slash disposal.	93%	<ol style="list-style-type: none"> 1. Where harvest is proposed within riparian areas, either slash should be removed with the tree or scattered. 2. Mechanical fuels treatments should occur on slopes < 40%. 3. Mechanical slash piling should not excessively disturb soil surface. 4. Scarification is limited to extent necessary to meet management objectives. 	All activities will comply with the 2015 KNF forest plan. Where harvest within riparian areas is proposed, either the slash would be removed with the tree or scattered and not treated.	TSA; FMO	B(T)6.5 C(T)6.50# B(T)6.7 C(T)6.7 C(T)6.71 C(T)6.753

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14.22	MODIFICATION OF THE TSC - To modify the TSC if new circumstances or conditions indicate the timber sale will cause irreversible damage to soil, water, or watershed values.	100%	1. Environmental modification procedure.	If TSC is not adequate to protect soil/water resources, the TSA and Contracting Officer are responsible for recommending modification of the TSC.	TSA	B(T)8.33
15.01	GENERAL GUIDELINES FOR TRANSPORTATION PLANNING - To introduce soil and water resource considerations into transportation planning.	100%	1. Complete a roads analysis. 2. Transportation plans include installation and maintaining proper drainage.	A roads Analysis has been completed. The IDT has evaluated watershed characteristics and estimated the response of soil and water resources to proposed transportation alternatives and activities.	IDT; ER	N/A
15.02	GENERAL GUIDELINES FOR THE LOCATION AND DESIGN OF ROADS AND TRAILS - To locate and design roads and trails with minimal soil and water impact while considering all design criteria.	95%	1. Follow the 2015 KNF forest plan. 2. Avoid sensitive landtypes, riparian areas, and wetlands during planning. 3. Use the minimum amount of roads and trails necessary to accomplish work. 4. Road designed for drainage efficiency. 5. Road drainage routed through adequate filtration before entering streams. 6. Stream crossings structures of proper size. New or replacement structures should pass the 100 year flow event. 7. Culverts conform to natural streambed and slope. 8. Ditch relief culverts have stable catch basins, inflow end protected from plugging, and skewed.	The IDT has insured that the location and design of roads and trails are based on multiple resource objectives. Mitigation measures have been designed to protect the soil and water resources identified in the NEPA process. Contract provisions will be prepared by the ER that meets the soil and water resource protection requirements.	IDT; ER	N/A
15.03	ROAD AND TRAIL EROSION CONTROL PLAN - To prevent, limit, and mitigate erosion, sedimentation, and resulting water quality degradation prior to the initiation of construction by timely implementation of erosion control practices.	96%	1. Seed and fertilize disturbed areas. 2. Install proper ditching and road slope. 3. Install proper drainage. 4. Incorporate road grade breaks. 5. Use minimum road or trail length/width necessary. 6. Avoid wet areas or areas of sensitive soil types. 7. Slash filter windrows used where needed and feasible.	IDT has established soil/water conservation objectives and mitigation measures. ER will then prepare a contract that reflects the objectives. ER will see that erosion control measures are approved and completed in a timely manner. IDT reviews projects to check effectiveness of erosion control features.	IDT; ER	B(T)6.31 B(T)6.6 B(T)6.312
15.04	TIMING OF CONSTRUCTION ACTIVITIES - To minimize erosion by conducting operations during minimal runoff periods.	98%	1. Avoid construction during wet periods.	IDT has outlined detailed erosion control measures in NEPA process. ER puts these measures into contract provisions. Compliance is assured by Contracting Officer or ER.	IDT; ER	B(T)6.31 B(T)6.312 B(T)6.6 SPS 204
15.05	SLOPE STABILIZATION AND PREVENTION OF MASS FAILURES - To reduce sedimentation by minimizing the chances for road-related mass failures, including landslides and embankment slumps.	99%	1. Avoid construction across unstable areas. 2. Construct embankments following approved engineering practices. 3. Use minimum road or trail length/width necessary. 4. Woody debris not incorporated into road-fill.	Road and trail construction in mountainous terrain requires cutting and loading natural slopes which may lead to landslides and/or embankment failures. In areas with intrinsic slope stability problems, appropriate technical resource personnel must be involved in an interdisciplinary approach to route location.	IDT; ER	N/A

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15.06	MITIGATION OF SURFACE EROSION AND STABILIZATION OF SLOPES - To minimize soil erosion from road cutslopes, fill slopes, and travel ways.	95%	<ol style="list-style-type: none"> 1. Seed and fertilize cut and fill slopes. 2. Install proper ditching and road slope. 3. Install proper drainage. 4. Incorporate road grade breaks. 5. Install ditch relief culverts before/after stream crossings. 6. Cut and fill slopes at stable angles. 	IDT has outlined detailed erosion control measures in the NEPA process. Stabilization techniques are included in contract provisions. Compliance is assured by Contracting Officer or ER.	IDT; ER	SPS 203, 204, 206A 210, 412 619, 625, 626 630 B(T)5.3, B(T)6.31 B(T)6.6, B(T)6.62 B(T)6.66 B(T)6.312, C(T)6.6 C(T)6.601#
15.07	CONTROL OF PERMANENT ROAD DRAINAGE - To minimize the erosive effects of concentrated water and degradation of water quality by proper design and construction of road drainage systems and drainage control structures.	94%	<ol style="list-style-type: none"> 1. Avoid long sustained steep grades. 2. Install/maintain adequate surface drainage and ditch relief culverts (inlet clean, skewed). 3. Prevent erosion of culvert and bridge fills. 4. Maintain ditches. 5. New roads/temp roads should be constructed outside SMZs/RHCAs. 6. Energy dissipaters place at structure outlets. 	IDT has identified locations, design criteria, drainage control features, and mitigation. Compliance will be assured by the ER/Contracting Officer.	ER	B(T)5.3 C(T)5.31# B(T)6.311 B(T)6.6 C(T)6.6
15.08	PIONEER ROAD CONSTRUCTION - To minimize sediment production and mass wasting associated with pioneer road construction.	100%	<ol style="list-style-type: none"> 1. Insure stable slopes during construction. 2. Seed and fertilize exposed soil. 3. Avoid construction during wet periods. 4. Use slash filter windrows. 	ER/Contracting Officer will be responsible for enforcing contract specifications. The purchaser is responsible for submitting an operating plan that includes erosion control measures.	ER	B(T)6.6 B(T)5.23 B(T)6.31 B(T)6.312 B(T)6.311 SPS 204
15.09	TIMELY EROSION CONTROL MEASURES ON INCOMPLETE ROADS AND STREAM CROSSING PROJECTS - To minimize erosion of and sedimentation from disturbed ground on incomplete projects.	96%	<ol style="list-style-type: none"> 1. Avoid construction during wet periods. 2. Use slash filter windrows or silt fence. 3. Seed and fertilize disturbed areas. 	IDT has identified project location and mitigation measures in NEPA process. Protective measures will be kept current on all areas of disturbed, erosion-prone areas. TSA insures contract compliance.	IDT; TSA	B(T)6.31 B(T)6.6 B(T)5.23 B(T)6.66 C(T)6.6
15.10	CONTROL OF ROAD CONSTRUCTION, EXCAVATION, AND SIDE-CAST MATERIAL - To reduce sedimentation from unconsolidated excavated and side-cast material caused by road construction, reconstruction, or maintenance.	96%	<ol style="list-style-type: none"> 1. Do not side-cast into waterways or sensitive areas. 2. Waste material from activities not place in a problem location. 3. Use slash-filter windrows or silt fence. 	IDT has identified project location and mitigation measures in NEPA process. Protective measures will be kept current on all areas of disturbed, erosion-prone areas. TSA insures contract compliance.	IDT; TSA	B(T)5.3 C(T)5.31# SPS 203 SPS 204
15.11	SERVICING AND REFUELING EQUIPMENT - To prevent contamination of waters from accidental spills of fuels, lubricants, bitumens, and other harmful materials.	99%	<ol style="list-style-type: none"> 1. Insure proper fuel storage and transportation. 2. Keep fuel, shop debris, and waste oil from streams, wetlands, ponds, and lakes. 	ER/TSA/Contracting Officer will designate the location, size, and uses of service refueling areas. All projects will adhere to the KNF Hazardous Substance Spill Plan in case of accidents.	ER; TSA	B(T)6.222 B(T)6.34 B(T)6.341
15.12	CONTROL OF CONSTRUCTION IN RIPARIAN AREAS - To minimize the adverse effects on riparian areas from roads.	98%	<ol style="list-style-type: none"> 1. Follow the 2015 KNF Forest Plan for construction within riparian areas. 2. Use slash filter windrows or silt fence. 3. Install/maintain adequate surface drainage and ditch relief culverts. 4. Number of stream crossings minimized on new and temp road construction. 	Proposed new and temporary roads will adhere to guidelines in the Montana Streamside Management Zone Law (HB-731). All road activities will follow 2015 KNF Forest Plan.	ER; TSA	B(T)6.5 B(T)6.62 C(T)6.50# SPS 206 SPS 206A

SWCP	SWCP OBJECTIVE	PERCENT EFFECTIVE	RECOMMENDED BEST MANAGEMENT PRACTICES BY IDT/TSA	CONSIDERATIONS FOR BEST MANAGEMENT PRACTICES	PERSON(S) RESPONSIBLE	CONTRACT PROVISIONS
15.13	CONTROLLING IN-CHANNEL EXCAVATION - To minimize stream channel disturbances and related sediment production.	96%	1. Use silt fence to minimize introduced sediment. 2. Use minimum amount of road. 3. Construct minimum number of crossings. 4. Stream channel disturbance minimized, on-site erosion prevented, and sedimentation prevented.	BMP improvements at crossings would adhere to the guidelines in Montana Streamside Management Zone Law (HB-731) and the 2015 KNF Forest Plan.	ER; TSA	B(T)6.5 SPS 204 SPS 206 206A
15.14	DIVERSION OF FLOWS AROUND CONSTRUCTION SITES - To minimize downstream sedimentation by insuring all stream diversions are carefully planned.	93%	1. Divert stream flow around construction. 2. Use silt fence to minimize introduced sediment. 3. Construction during low-flow	Where construction occurs at stream crossings, all required permits would be obtained. This would require the State Fish, Wildlife, and Parks to review the adequacy of the proposed mitigation. Compliance with contract provisions would be done by the ER.	HYD; FB; ER	B(T)6.5 B(T)6.31 C(T)6.50# C(T)6.6
15.15	STREAM CROSSINGS ON TEMPORARY ROADS - To keep temporary roads from unduly damaging streams, disturbing channels, or obstructing fish passage.	97%	1. Consult Watershed Personnel on placement. 2. Use minimum number of stream crossings. 3. Construction during low-flow. 4. Follow the 2015 KNF Forest Plan guidelines for construction within riparian areas. 5. Stream crossings are installed at right angles, if practical. 6. Temporary stream crossings are adequately removed and channel cross-section is restored.	The IDT identifies areas in need of a temporary road during the NEPA process. Proposed stream crossings would adhere to the guidelines in Montana Streamside Management Zone Law (HB-731).	PSF; TSA	N/A
15.16	BRIDGE AND CULVERT INSTALLATION - To minimize sedimentation and turbidity resulting from excavation for in-channel structures.	97%	1. Installation should be done during periods of low flow. 2. Instream sediment retention devices should be used throughout implementation.	IDT has identified project location and mitigation measures in NEPA process. Protective measures will be kept current on all areas of disturbed, erosion-prone areas. TSA insures contract compliance.	IDT; TSA; ER	C(T)6.5#
15.17	REGULATION OF BORROW PITS, GRAVEL SOURCES, AND QUARRIES - To minimize sediment production from borrow pits, gravel sources, and quarries and limit channel disturbance in those gravel sources suitable for development in floodplains.	98%	1. Permit sand and gravel removal in RHCAs only if no alternative exists and adverse effects to water resources are minimized or avoided. 2. Borrow and gravel pits located and left in a condition to prevent sediment delivery. 3. Limit the area of operation to a minimum while providing sufficient area for material processing and stockpiling. 4. Phase development where practicable.	Construct and operate borrow pits, gravel sources, and quarries in a manner that minimizes effects to soil and water resources.	ER	B(T)6.5 C(T)6.50#
15.18	DISPOSAL OF RIGHT-OF-WAY AND ROADSIDE DEBRIS - To insure that debris generated during road construction is kept out of streams and prevent slash and debris from subsequently obstructing channels.	98%	1. Debris and slash generated during road construction should not be side-cast into streams.	Proposed road construction will adhere to the guidelines in the Montana Streamside Management Zone Law (HB-731).	ER	Std Spec 201 SPS 201
15.19	STREAM BANK PROTECTION - To minimize sediment production from stream banks and structural abutments in natural waterways.	98%	1. Take precautions to minimize or eliminate disturbance to stream banks. 2. Maintain instream structures.	IDT has identified project location and mitigation measures during NEPA process. Protective measures will be kept current on all areas of disturbed soils. TSA and ER insure contract compliance.	IDT; ER; TSA	Std Spec 619

SWCP	SWCP OBJECTIVE	PERCENT EFFECTIVE	RECOMMENDED BEST MANAGEMENT PRACTICES BY IDT/TSA	CONSIDERATIONS FOR BEST MANAGEMENT PRACTICES	PERSON(S) RESPONSIBLE	CONTRACT PROVISIONS
15.20	WATER SOURCE DEVELOPMENT CONSISTENT WITH WATER QUALITY PROTECTION - To supply water for road construction and maintenance and fire protection while maintaining water quality.	93%	<ol style="list-style-type: none"> 1. Clean equipment before drafting and when changing between water sources to prevent the spread of aquatic invasive species. 2. When drafting water, pumps should be screened to prevent entrainment of fish or other aquatic organisms. 	Conduct water drafting at suitable locations and in a manner that avoids or minimizes adverse effects to water quality, fisheries, and other aquatic organisms.	ER; FMO	Std Spec 207
15.21	MAINTENANCE OF ROADS - To maintain all roads in a manner that provides for soil and water protection by minimizing rutting, failures, side-cast, and blockage of drainage facilities.	96%	<ol style="list-style-type: none"> 1. Road grading sufficient to maintain road surface where necessary. 2. Erosion control features maintained in an operational condition. 3. Road grading avoids cutting toe of cut-slope. 4. Road and/or culvert maintenance did not side-cast sediment into or near a water body. 	Road maintenance associated with a timber sale is the responsibility of purchaser. The ER/SA will insure that the purchaser maintains roads according to the appropriate maintenance level.	ER; TSA	B(T)5.12 B(T)5.3 B(T)6.6 C(T)6.6 C(T)5.31# C(T)5.32# B(T)6.31
15.22	ROAD SURFACE TREATMENT TO PREVENT LOSS OF MATERIALS - To minimize the erosion of road surface materials and, consequently, reduce the likelihood of sediment production.	98%	<ol style="list-style-type: none"> 1. Maintenance of road surface should include proper blading and/or dust abatement. 2. Use crush-gravel where necessary. 	Protective measures will be kept current on all areas of disturbed, erosion-prone areas. ER insures contract compliance.	IDT; ER	B(T)5.3 C(T)5.31# C(T)5.314#
15.23	TRAFFIC CONTROL DURING WET PERIODS - To reduce the potential for road surface disturbance during wet weather and reduce sedimentation.	97%	<ol style="list-style-type: none"> 1. Road use avoided during wet periods. 	Road restrictions and traffic control measures will be implemented on all haul roads when damage would occur during spring break up. The decision to restrict a road is made by the ER. Hauling restrictions would be controlled by the TSA.	ER; TSA	B(T)6.6 C(T)6.6 C(T)5.316# C(T)5.41#
15.24	SNOW REMOVAL CONTROLS - To minimize the impact of snow melt on road surfaces and embankments and reduce the probability of sediment production resulting from snow removal operations.	97%	<ol style="list-style-type: none"> 1. Be careful not to leave snow berm at edge of road where possible. 2. Where a berm cannot be avoided, insure proper drainage by opening sections of berm to allow water to leave road surface. 	Snow removal will be kept current on all roads associated with winter logging operations. The TSA insures compliance with contract provisions.	IDT; TSA	C(T)5.316# Std Spec 203.09
15.25	OBLITERATION OF TEMPORARY ROADS - To reduce sediment generated from temporary roads by obliterating them at the completion of their intended use.	97%	<ol style="list-style-type: none"> 1. Re-contour road fully where feasible. 2. Seed and fertilize exposed soil. 3. Pull slash and woody debris back onto rehabilitated road. 	This work will be done on all new temporary roads in the decision area. The work will be done by the purchaser with compliance by the TSA. Roads will be left in a condition to provide adequate drainage without further maintenance.	TSA	B(T)6.63 C(T)6.6 C(T)6.632# C(T)6.633#
18.03	PROTECTION OF SOIL AND WATER FROM PRESCRIBED BURNING EFFECTS - To maintain soil productivity, minimize erosion, and prevent ash, sediment, nutrients, and debris from entering surface water.	100%	<ol style="list-style-type: none"> 1. Follow 2015 KNF Forest Plan Riparian Guidelines for burning in RHCAs. 2. Adhere to SMZ Law. 3. Where harvest within riparian areas is proposed, either the slash should be removed with the tree or scattered and not treated. 4. Limit soil and water quality impact of prescribed fire. 5. Adequate erosion protection on firelines, sufficient until stabilized by vegetation. 	Broadcast burning adjacent to riparian areas will adhere to guidelines in the Montana Streamside Management Zone Law (HB-731). Prescribed burn plans identify the conditions necessary to prevent soil damage and meet site preparation objectives.	FMO	N/A

Appendix 3

Glossary

Action Alternative - An alternative that proposes some management action, as contrasted to the No Action Alternative.

Administrative Appeal - A request to a higher authority for review of a decision related to an Environmental Impact Statement, Environmental Analysis, or Categorical Exclusion.

Affected Environment - The biological and physical environment that will or may be changed by actions proposed and the relationship of people to that environment.

Age or Size Class - A distinct group of trees, or portion of growing stock recognized on the basis of age (or size).

Airshed - Basic geographic units in which air quality is managed.

Alternative - A combination of management prescriptions applied in specific amounts and locations to achieve a desired management emphasis. One of the several policies, plans or projects, proposed for decision-making.

Bear Management Area (BMA) – Areas delineated to include important habitat components and to implement standards and guidelines pertaining to grizzly bears. These areas have also been used for evaluating habitat for other wildlife species including big game and old growth indicator species.

Bear Management Subunit – An area approximately the size of an average female home range (about 50 mi²), generally from ridge top to valley bottom, and including all seasonal habitats.

Best Management Practices (BMPs) - Methods, measures or practices to prevent or reduce water pollution, including but not limited to, structural and non-structural controls, operation and maintenance procedures, other requirements, and scheduling and distribution of activities.

Usually BMPs are applied as a system of practices rather than a single practice. BMPs are selected on the basis of site-specific conditions that reflect natural background conditions and political, social, economic, and technical feasibility.

Biological Assessment (BA) - A document prepared by a federal agency for the purpose of identifying any endangered species or threatened species, which is likely to be affected by an agency action. This document facilitates compliance with the Endangered Species Act. The federal agency, in consultation with the Secretary of Interior, must insure that any action authorized, funded, or carried out by a federal agency is not likely to jeopardize the continued existence of any endangered or threatened species, or result in the destruction or adverse modification of its habitat.

Biological Evaluation (BE) - A document prepared by the Forest Service to review programs or activities to determine how an action might affect any threatened, endangered, proposed, or sensitive species. This document often focuses only on sensitive species if the Threatened, Endangered, and Proposed Species will be covered in a Biological Assessment.

Biomass (Fuels) - Live and dead accumulations of organic material.

Blowdown (Windthrow) - Uprooting by the wind. Also refers to a tree or trees so uprooted.

Board Foot - A unit of measurement represented by a board one foot square and one inch thick.

Browse - Twigs, leaves, and young shoots of trees and shrubs on which animals feed; in particular, those shrubs which are used by big game animals for food.

Buffer – A land area designated to block or absorb unwanted effects to the area beyond the buffer and to preserve other qualities along or adjacent to roads, trails, watercourses, and recreation sites.

Burn Severity– A relative measure of the degree of change in a watershed that related to the intensity of the fire on soil hydrological function. Burn severity is delineated on topographic maps of polygons. Classes of burn severity are high, moderate, low, and unburned.

Canopy - The forest cover of branches and foliage formed by tree crowns.

Canopy Cover or Crown Closure - The percentage of ground surface that is shaded by the live foliage of plants as seen from above. Used to describe how open or dense a stand of trees is.

Capability - The potential of an area of land and/or water to produce resources, supply goods and services, and allow resource uses under a specified set of management practices and at a given level of management intensity. Capability depends upon current conditions and site conditions such as climate, slope, landform, soils, and geology; as well as the application of management practices, such as silviculture or protection from fires, insects, and disease.

Cavity - A hollow in a tree that is used by birds or mammals for nesting, denning, roosting, etc.

Closed Canopy - The description given to a stand when the crowns of the main level of trees forming the canopy are touching and intermingled so that light cannot reach the forest floor directly.

Coarse Woody Debris (CWD) - Any piece(s) of dead woody material, e.g., dead boles, limbs, and large root masses on the ground or in streams.

Cohort - An age class of trees that is distinctively different from other age classes in a particular forest stand.

Commercial Thinning - A Silviculture treatment that “thins” out an overstocked stand by removing trees, which are large enough to be sold as products such as poles or fence posts. It is carried out to improve the health and growth rate of the remaining crop trees.

Composition (Species) - The mix of different species that make up a plant or animal community, and their relative abundance.

Condition Class - A function of the degree of departure from historical fire regimes resulting in alterations of key ecosystem components, such as species composition, structural stage, stand age, and canopy closure. Categorized by three classes as follows: Condition Class 1 - Fire regimes are within or near an historical range; Condition Class 2 - Fire regimes have been moderately altered from their historical range; Condition Class 3 - Fire regimes have been significantly altered from their historical range.

Consultation - A process required by Section 7 of the ESA whereby Federal agencies proposing activities in a listed species habitat confer with the U.S. Fish and Wildlife Service about the impacts of the activity on the species. Consultation may be informal, and thus advisory, or formal, and thus binding.

Corridor - A band of vegetation, usually older forest, which serves to connect distinct patches on the landscape. By providing connectivity, corridors permit the movement of plant and animal species between what would otherwise be isolated patches.

Council on Environmental Quality (CEQ) - An advisory council to the President established by the National Environmental Policy Act of 1969. It reviews Federal programs for their effect on the environment, conducts environmental studies, and advises the President on environmental matters.

Cover/Forage Ratio - The ratio of tree cover (usually conifer types) to foraging areas (natural openings, clearcuts, etc.).

Cover Type - The present vegetation composition of an area, described by the dominant plant species.

Crown - The part of a tree or other woody plant bearing live branches and foliage.

Crown Closure (see Canopy Cover)

Crown Fire - A fire that advances from top-to-top of trees or shrubs more or less independently of the surface fire. Sometimes, crown fires are classed as either running or dependent, to distinguish the degree of independence from the surface fire.

Cultural Resources - The physical remains of human activity (artifacts, ruins, burial mounds, petroglyphs, etc.) and conceptual content or context (as a setting for legendary, historic, or prehistoric events; as a sacred area of native peoples, etc.) of an area of prehistoric or historic occupation.

Cumulative Effect - The impact on the environment, which results from the incremental impact of the action when added to other actions. Cumulative impacts can also result from individually minor but collectively significant actions taking place over a period of time.

Density (Stand) - The number of trees growing in a given area, usually expressed in terms of trees per acre.

Diameter Best Height (DBH) - The diameter of a tree measured four and one-half feet above the ground.

Direct Effect - Effects on the environment that occur at the same time and place as the initial cause or action.

Dispersal - The movement of organisms away from the place of birth or from centers of population density.

Disturbance (Ecosystem) - Refers to events that alter the structure, composition, or function of terrestrial or aquatic habitats. Natural disturbances include, among others, drought, floods, wind, fires, wildlife grazing, and insects and pathogens. Human-caused disturbances include actions such as timber harvest, livestock grazing, roads, and the introduction of exotic species.

Diversity - The distribution and abundance of different plant and animal communities and species.

Duff - The partially decayed organic matter on the forest floor.

Early Seral/Structural Stage - A stage of development of an ecosystem from a disturbed, relatively unvegetated state to a plant community that is up to 30 years old. Stand structure is seedling and sapling sized.

Ecosystem - A functional unit consisting of all the living organisms (plants, animals, and microbes) in a given area, and all the non-living physical and chemical factors of their environment, linked together through nutrient cycling and energy flow. An ecosystem can be of any size--a log, pond, field, forest, or the earth's biosphere--but it always functions as a whole unit. Ecosystems are commonly described according to the major type of vegetation, for example, forest ecosystem, old-growth ecosystem, or range ecosystem.

Endangered Species - Any species, plant, or animal that is in danger of extinction throughout all or a significant portion of its range. In accordance with the 1973 ESA, the Secretary of the Interior identifies endangered species.

Endemic - A species whose natural occurrence is confined to a certain region and whose distribution is relatively limited (vertebrate biology). A population that is at equilibrium or low density (invertebrate biology or pathology).

Escape Route - A means to access a safety zone.

Fire Exclusion - The disruption of a characteristic pattern of fire intensity and occurrence (primarily through fire suppression).

Fire Event (Fire Occurrence, Fire Incidence) - A single fire or series of fires within an area at a particular time.

Fire Frequency - A general term referring to the recurrence of fire in a given area over time.

Fire Hazard - The potential fire behavior for a fuel type, regardless of the fuel type's weather-influenced fuel moisture content or its resistance to fire line construction. Assessment is based on physical fuel characteristics, such as fuel arrangement, fuel load, condition of herbaceous vegetation, and presence of elevated fuels.

Fire Intensity - Based on temperature, flame length, rate of spread, heat of combustion, and total amount and size of fuel consumed. Accounts for convective heat rising into the atmosphere and fire effects to the overstory.

Fire Intolerant (or "intolerant") - Species of plants that do not grow well or die from the effects of fire. Generally these species are shade-tolerant as well.

Fire Regimes - The ecological effects of frequency, intensity, extent, season, and synergistic interactions with other disturbances, such as insects and disease, classified into generalized levels of fire severity.

Fire Return Interval (Fire Interval) - The number of years between successive fire events in a given area.

Fire Risk - The probability or chance of fire starting determined by the presence and activities of causative agents.

Fire Rotation - The length of time necessary for an area equal in size to the study area to burn.

Fire Severity - A relative measure of the post-fire appearance of vegetation (residual fuels/mortality) as it related to the intensity of the fire and its consumptive effects on vegetation.

Fire Suppression (Fire Control) - All of the work and activities connected with fire extinguishing operations, beginning with discovery and continuing until the fire is completely extinguished.

Fire Tolerant (or "tolerant") - Species of plants that can withstand certain frequency and intensity of fire. Generally these species are shade-intolerant as well.

Firefighter Safety - A work environment where foreseeable risks have been minimized through the mitigation of known hazards associated with wildlife suppression.

Fish Habitat - The place where a population of fish species lives and its surroundings; includes the provision of life requirements such food and cover.

Fish Passage - Clear access for migrating fish through a potential barrier.

Fishery - The total population of fish in a stream or body of water and the physical, chemical, and biological factors affecting that population.

Forage - All browse and non-woody plants available to livestock or wildlife for feed.

Forb – Any herbaceous (herb-like) plant other than grass or grass-like plants that has little or no wood on it. For example, wildflowers are forbs.

Forest Development Road (FDR) - A road wholly or partly within or adjacent to and serving the National Forest System and which is necessary for the protection, administration, and use of the National Forest System and the use and development of its resources.

Forest Health - (also called forested landscape or forestland) is defined as: the conditions under which the integrity of the soil and ecological processes are sustained resulting in systems that maintain their diversity, resiliency, and productivity with associated sustainable human resource issues.

Forest Plan - The Flathead National Forest Land and Resource Management Plan.. A Forest Plan is a document prepared under the National Forest Management Act by each national forest that generally describes how the resources in the forest will be managed for a 10 to 15 year period.

Forest Structure - The mix and distribution of tree sizes, layers, and ages in a forest. Some stands are mostly one size (single-story), some are two-story, and some are a mix of trees of different ages and sizes (multi-story).

Forest Type - Relates to the tree species (and to generalized understory plant) composition.

Fuels - Includes living plants, dead, woody vegetative materials; and other vegetative materials capable of burning.

Fuel Loading - The oven dry weight of fuels in a given area, usually expressed in tons per acre. Fuel loadings may be referenced to fuel size or time-lag categories; and may include surface fuels or total fuels.

Fuel Management - Manipulation or reduction of flammable matter for the purpose of reducing the intensity or rate of spread of a fire, while preserving and enhancing environmental quality.

Fuel Treatment - The rearrangement or disposal of natural or activity fuels.

Geographic Information System (GIS) - Computer software that provides database and spatial analytic capabilities.

Goal – A concise statement that describes a desired condition to be achieved. It is normally expressed in broad, general terms and is timeless in that it has no specific date that it is to be completed. Goal statements form the principal basis upon which objectives are developed.

Guideline - An indication or outline of policy or conduct dealing with the basic management of the Forest. Forest-wide management standards and guidelines apply to all areas of the Forest regardless of the other management prescriptions applied.

Habitat Type - An aggregation of all land areas potentially capable of producing similar plant communities at climax.

Hazard - A real or potential condition that may result in an undesired event, the cause of risk. Hazard can apply to the probability of tree mortality or damage by an insect or disease and also represents material or fuel that will ignite and burn.

Hiding Cover - Vegetation used by an animal for hiding. The amount and quality of vegetation needed depends on the animal's size, mobility, and reluctance to venture into relatively open areas. For an elk, hiding cover conceals 90 percent of a standing adult elk from the view of a human at a distance equal to or less than 200 feet. Hiding cover allows elk to use areas for bedding, foraging, thermal relief, wallowing, or other functions, but it does not necessarily provide security during the hunting season.

Historic Range of Variability (HRV) - Conditions which be expected to occur under natural disturbance and succession regimes.

Home Range - An area, from which intruders may or may not be excluded, to which an individual restricts most of its usual activities.

Indirect Effects - Secondary effects which occur in locations other than the initial action or significantly later in time.

Initial Attack - An aggressive suppression action consistent with firefighter and public safety and values to be protected.

Instream Cover - Anything in the water that provides protection to fish from predators (including turbulence, debris, logs, and rocks).

Intensity - Energy release rates; these are physical descriptors of the fire, not its ecological effects.

Generally referred to as High, Moderate, or Low intensity.

Interdisciplinary Team (ID Team) - A group of individuals with different training assembled to solve a problem or perform a task. The team is assembled out of recognition that no one scientific discipline is sufficiently broad to adequately solve the problem. Through interaction, participants bring different points of view to bear on the problem.

Intermittent Stream - A stream which flows only at certain times of the year when it receives water from springs or from some surface source such as melting snow.

Invasive Plant – All State and county listed “noxious weeds” are considered invasive plants. Also, other exotic species (not listed by State or counties as noxious weeds) that can successfully out compete and displace native plant communities.

Inventoried Roadless Area - areas designated pursuant to 36 CFR 294 Subpart B, §294.11. This includes areas identified in a set of inventoried roadless area maps, and included in the Forest Plan Appendix C. The Department of Agriculture, Forest Service adopted the Roadless Area Conservation Rule in 2001 (36 CFR 220 Subpart B).

Issue - See Public Issue.

Ladder Fuels - Fuels which provide vertical continuity between the surface fuels and crown fuels in a forest stand, thus contributing to the ease of torching and crowning.

Landscape - The landforms of a region in the aggregate; the land surface and its associated habitats at scales of many acres to many square miles; a spatially heterogeneous area.

Landtype - An inventory map unit with relatively uniform potential for a defined set of land uses. Properties of soils landform, natural vegetation, and bedrock are commonly components of landtype delineation used to evaluate potentials and limitations for land use.

Large Woody Debris – Large logs and stumps in streams and on land that provide habitat for aquatic and terrestrial organisms and affects stream function.

Late Seral/Structural Stage - A stage of development of an ecosystem from approximately 80 to 120 years old. Forested stands are generally 12 to 16 inches average dbh.

Lethal Fire/Lethal Fire Regime - Fire that consumes the entire vegetative community (grasses, shrubs, trees. Also see Stand Replacement Fire.

Linkage (Habitat) - Linkage zones are combinations of landscape structural factors that allow wildlife to move through, and live within, areas influenced by human actions. A linear habitat patch through which a species must travel to reach habitat more suitable for reproduction and other life-sustaining needs.

Low Severity Ground Fire - A fire with low intensity that primarily scorches tree boles, allowing fire-tolerant species to survive.

Maintenance Level (ML) – The Maintenance Level of a road indicates the type of traffic it can accommodate.

Management Area (MA) - An aggregation of capability areas that have common management direction and may be dispersed over the Forest. Consists of a grouping of capability areas selected through evaluation procedures and used to locate decisions and resolve issues and concerns.

Management Indicator Species (MIS) - Species identified in a planning process that are used to monitor the effects of planned management activities on viable populations of wildlife and fish including those that are socially or economically important.

Mature Timber - Individual trees or stands of trees that in general are at their maximum rate in terms of the physiological processes expressed as height, diameter, and volume growth.

MBF and MMBF - Thousand board feet and million board feet, respectively.

Mean Fire Return Interval (Mean Fire Interval) – The average of all fire intervals in a given area over a given time period.

Mesic - Moderately moist.

Mid-Seral/Structural Stage - A stage of development of an ecosystem from approximately 30 to 80 years old. Forested stands are generally 5 to 12 inches average dbh. Stand structure is pole- and small sawlog-sized trees.

Mixed-Severity Fire/Mixed Severity Fire Regime - Mixed-severity fire regime areas can experience the full range of fire severities during either a single event or consecutive events. In other words, in a single fire event both low severity (killing few trees) and high severity (killing all trees) in patches of variable sizes. This tends to create complex fine-grained spatial patterns of vegetation conditions across a landscape.

Monitoring and Evaluation - The periodic evaluation on a sample basis of Forest Plan management practices to determine how well objectives have been met and how closely management standards have been applied.

Montane - Of, growing in, or inhabiting mountain areas.

National Environmental Policy Act (NEPA) - An act which encourages productive and enjoyable harmony between man and his environment; promotes efforts to prevent or eliminate damage to the environment and biosphere and stimulate the health and welfare of man; enriches the understanding of the ecological systems and natural resources important to the Nation; and establishes a Council on Environmental Quality.

National Forest Management Act (NFMA) - A law passed in 1976 as amendments to the Forest and Rangeland Renewable Resources Planning Act that requires the preparation of Regional and Forest Plans and the preparation of regulations to guide that development.

National Forest System (NFS) - All national forest lands reserved or withdrawn from the public domain of the United States, all national forests lands acquired through purchase, exchange, donation, or other means, the national grasslands and land utilization projects administered under Title III.

National Wilderness Preservation System - All lands covered by the Wilderness Act and subsequent wilderness designations, irrespective of the department or agency having jurisdiction.

Native Species - Species that are indigenous to a region, as opposed to introduced or exotic species.

Native (Natural) Succession and Disturbance Regimes - The historic patterns (frequency and extent) of fire, insects, wind, landslides, and other natural processes in an area.

Natural Regeneration - Renewal of a tree crop by natural seeding, sprouting, suckering, or layering.

No Action Alternative - The management direction, activities, outputs, and effects most likely to exist in the future if the current plan would continue unchanged.

Non-Lethal Fire/Non-Lethal Fire Regime – Fire that primarily consumes surface fuels causing little mortality to overstory trees. See also Low Severity Fire.

Noxious and Invasive Weed EA (NIWC EA)

Noxious Weed - Any exotic plant species established or that may be introduced in the area which may render land unfit for agriculture, forestry, livestock, wildlife, or other beneficial uses.

Old Growth Habitat - A community of forest vegetation that has reached a late stage of plant succession characterized by a diverse stand structure and composition along with a significant showing of decadence. The stand structure will typically have multi-storied crown heights and variable crown densities. There is a variety of tree sizes and ages ranging from small groups of seedlings and saplings to trees of large diameters exhibiting a wide range of defect and breakage both live and dead, standing and down. The time it takes for a forest stand to develop into old growth condition depends on many local variables such as forest type, habitat type, and climate. Natural chance events involving forces of nature such as weather, insect, disease, fire, and the actions of man also affects the rate of development of old-growth stand conditions.

Open Road – A road with no restrictions on motorized vehicle use.

Overmature Timber - Individual trees or stands of trees that in general are past their maximum rate in terms of the physiological processes expressed as height, diameter, and volume growth.

Overstory - The portion of the trees that form the uppermost canopy layer in a forest of more than one story.

Perennial Streams - Streams that flow continuously throughout most years and whose upper surface generally stands lower than the water table in the region adjoining the stream.

Phloem – The layer of cells under the bark and outside of the cambium layer responsibility for transporting food created by the leaves.

Pole - A tree between a sapling and small timber size at least 5 inches DBG but smaller than 8 inches DBH.

Pool - A portion of the stream with reduced current velocity, often with water deeper than the surrounding areas, and which is usable by fish for resting and cover.

Population - A group of coexisting (conspecific) individuals that interbreed if they are sexually reproductive.

Potential Habitat (Wildlife) - Habitat that is likely to be occupied by a wildlife species or group of species, currently or in the near future.

Potential Vegetation Group (PVG) - Groupings of habitat groups on the basis of similarity of general moisture or temperature environment.

Pre-Commercial Thinning - The selective felling, deadening, or removal of trees in a young stand primarily to accelerate diameter increment on the remaining stems, maintain a specific stocking or stand density range, and improve the vigor and quality of the trees that remain.

Preferred Alternative - The Agency's preferred alternative is the alternative that the agency believes would best fulfill its statutory mission and responsibilities, giving consideration to economic, environmental, technical and other factors, and which meets the purpose and need of the NEPA document.

Prescribed Burning - The controlled use of fire to reduce or eliminate the unincorporated organic matter of the forest floor, or low, undesirable vegetation. A written, approved prescribed fire plan must exist, and NEPA requirements must be met, prior to ignition.

Proposed Action - The proposed action or proposal exists at that stage in the development of an action when an agency subject to the Act (NEPA) has a goal and is actively preparing to make a decision on one or more alternative means of accomplishing that goal and the effects can be meaningfully evaluated.

Public Involvement - A process designed to broaden the information base upon which agency decisions are made by informing the public about Forest Service activities, plans, and decisions, and participation in the planning processes which lead to final decision making.

Public Issue - A subject or question of widespread public interest identified through public participation relating to management of NFS lands.

Ranger District – Administrative subdivision of the Forest supervised by a District Ranger.

Reach - A length of stream channel, lake, or inlet exhibiting, on average, uniform hydraulic properties and morphology.

Rearing Habitat - In the case of juvenile westslope cutthroat trout, this is primarily the pool environment in streams.

Recovery Plan - A plan that details actions or conditions necessary to promote species recovery, that is, improvement in the status of species listed under the ESA to the point at which listing is no longer appropriate. Plans are required for virtually all listed species.

Reforestation - The renewal of forest cover by seeding, planting, and natural means.

Regeneration - The renewal of a forest, whether by natural or artificial means. This term may also refer to a tree crop itself.

Rehabilitation (Road) - The act of maintaining a road and improving drainage features, usually to meet BMP standards.

Release - Freeing a tree or group of trees from more immediate competition by cutting or otherwise eliminating growth that is overtopping or closely surrounding them.

Resident Fish - Non-migratory fish species.

Resilient, Resiliency - The ability of a system to respond to disturbances. Resiliency is one of the properties that enable the system to persist in many different states or successional stages.

Responsible Official - The Forest Service employee who has the authority to select and/or carry out a specific planning action.

Restore, Restoration - The re-creation of a natural or self-sustaining, resilient community or ecosystem, or a movement in that direction.

Restricted Road - A road on which motorized vehicle use is restricted during the entire non-denning period. The road requires physical obstruction and motorized vehicle use in the non-denning period is legally restricted by order.

Riparian Areas - Areas with distinctive resource values and characteristics that are comprised of an aquatic ecosystem and adjacent upland areas that have direct relationships with the aquatic system. This is considered the horizontal distance of approximately 100 feet from the normal high water line of a stream channel, or from the shoreline of a standing body of water.

Riparian Ecosystem - A transition between the aquatic ecosystem and the adjacent upland terrestrial ecosystem. It is identified by soil characteristics and by distinctive vegetative communities that require free or unbounded water.

Riparian Habitat Conservation Area (RHCA) - Portions of watersheds where riparian-dependent resources receive primary emphasis and management activities are subject to specific standards and guidelines. Riparian Habitat Conservation Areas were established as INFISH guidelines.

Riparian Land Type - Integrated map units of the types of riparian habitats based on topography, substrate materials (i.e., clays or boulders), and associated vegetation.

Riparian Wildlife Habitat - Vegetation growing close to a watercourse, lake, swamp, or spring that is generally critical for wildlife cover, fish food organisms, stream nutrients and large organic debris, and for streambank stability.

Risk - The probability of a hazard and/or the consequences of that hazard (hazards are undesirable events).

Road Density - Number of miles in a given area.

Road Management - The combination of both traffic management and maintenance management operations. Traffic management is the continuous process of analyzing, controlling, and regulating uses to accomplish National Forest objectives. Maintenance management is the perpetuation of the transportation facility to serve intended management objectives.

Salvage - Harvest of trees that are dead, dying, or deteriorating due to fire, wind, insect or other damage, or disease.

Sapling - A young tree that is larger than a seedling but smaller than a pole, typically 5 to 25 feet tall.

Scoping Process - An early and open process for determining the scope of issues to be addressed and for identifying the significant issues related to the proposed action. Identifying the significant environmental issues deserving of study and deemphasizing insignificant issues, narrowing the scope of the environmental impact statement accordingly (CEQ regulations, 40 CFR 1501.7).

Security - The protection inherent in any situation that allows a wildlife species to remain in a defined area despite an increase in stress or disturbance, such as that associated with hunting season. The components of security include vegetation, topography, the size of the blocks of vegetation, road density, distance from roads, intensity of the disturbance, and seasonal timing.

Sediment - Solid material, both mineral and organic, that is in suspension, being transported, or has been moved from its site of origin by air, water, gravity, or ice.

Seedling - A young tree that has just germinated but has not yet reached sapling size, typically 1 to 5 feet tall.

Seedling/Sapling - A size category for forest stands in which trees less 5 inches in diameter are the predominant vegetation.

Sensitive Species - Those wildlife and plant species identified by the Regional Forester for which population viability is a concern because of significant current or predicted downward trends in (a) population numbers or density, or (b) habitat capability that would reduce a species' existing distribution.

Seral - A biotic community that is developmental; a transitory stage in an ecologic succession.

Seral Stage (also called successional or structural stage) refers to vegetation structural development; and describes the mix and distribution of tree species, sizes, canopy layers, ages, and general conditions in a forest.

Seral/Structural Stage - A stage of development of an ecosystem from a disturbed, relatively unvegetated state to a complex, mature plant community.

Severity - Refers to the ecological effects of fires, usually on the dominant organisms of the ecosystem, for example a stand dominated by lodgepole pine.

Shade Intolerant - Species of plants that do not grow well or die from the effects of too much shade.

Generally, these are fire-tolerant species.

Shade Tolerant - Species of plants that can develop and grow in the shade of other plants.

Generally, these are fire-intolerant species.

Silviculture - The theory and practice of controlling the establishment, composition, growth, and quality of forest stands in order to achieve the objectives of management.

Silviculture Diagnosis - The process of compiling, summarizing, analyzing, and recording of stand data.

Silvicultural Prescription - A written document that describes management activities needed to implement silvicultural treatment or treatment sequence. The prescription documents the results of the analysis during the diagnosis phase.

Silvicultural Systems - A management process whereby forests are tended, harvested, and replaced, resulting in a forest of distinctive form. It includes all cultural management practices performed during the life of the stand, such as regeneration cutting, thinning, and use of genetically improved tree seeds and seedlings to achieve multiple resource benefits.

Site Preparation - A general term for a variety of activities that remove competing vegetation, slash, and other debris that may inhibit the reforestation effort.

Site Productivity - Production capability of a specific area of land.

Slash - The residue left on the ground after felling and other silvicultural operations and/or accumulating there as a result of storms, fire, or poisoning trees.

Snag - A standing dead tree usually greater than 5 feet in height and 6 inches DBH.

Soil Productivity - The capacity of a soil to produce a specific crop such as fiber and forage, under defined levels of management. It is generally dependent on available soil moisture and nutrients and length of growing season.

Spatial - Of, relating to, involving, or having the nature of space.

Spawning Habitat - Areas of substrate that provide well-oxygenated and suitable sized gravels for fish spawning.

Species - A group of actually or potentially interbreeding populations that are reproductively isolated from all other kinds of organisms.

Specified Road - See Forest Development Road, above.

Stagnation - A condition where plant growth is markedly reduced or even arrested through, e.g., competition, state of the soil, or disease.

Stand - A community of trees or other vegetative growth occupying a specific area and sufficiently uniform in composition (species), age, spatial arrangement, and conditions as to be distinguishable from the other growth on adjoining lands, so forming a silvicultural or management entity.

Stand Maintenance Fire (Non-Lethal) - Fire that emphasizes the survival of the living overstory vegetation.

Stand Replacement Fire - Fire that emphasizes the destruction of the living overstory vegetation. See also Lethal fire.

Stand Replacement Fire Regime - Stand-replacement fire regimes typically occur on lands that experience predominantly lethal fires, with less than 10 percent of the forested canopy cover remaining after the fire.

Stand-Replacing Disturbance - An agent such as fire, blowdown, insect or disease epidemic, or timber harvest that kills or removes enough trees to result in an early-seral/structural stage condition.

Standards and Guidelines - An indication or outline of policy or conduct dealing with the basic management of the Forest. Forest-wide management standards and guidelines apply to all areas of the Forest regardless of the other management prescriptions applied.

Stocking - A measure of timber stand density as it relates to the optimum or desired density to achieve a given management objective.

Structure - The various horizontal and vertical physical elements of the forest, including tree size, canopy composition, quantity and quality of deadwood, ephemeral herbaceous species, density of wildlife trees, fungi, age structure, forest height, etc.

Subspecies - Subpopulations or races within a species that are distinguishable by morphological characteristics and, sometimes, by physiological or behavioral characteristics.

Substrate - Mineral and/or organic material that forms the stream bed (stream bottom).

Summer Range - Land used by wildlife species (specifically big game and/or grizzly bear) during the summer months.

Succession - A predictable process of changes in structure and composition of plant and animal communities over time. Conditions of the prior plant community or successional stage create conditions that are favorable for the establishment of the next stage. The different stages in succession are often referred to as "seral stages."

Sustainability is defined as the capacity of forests, ranging from stands to eco-regions, to maintain their health, productivity, diversity, and overall integrity, in the long run, in the context of human activity and use.

System Road - See Forest Development Road, above.

Temporary Road - A road constructed to facilitate forest management activities but is reclaimed soon after the activity is completed.

Territory - Any area defended by one or more individuals against intrusion by others of the same or different species.

Thermal Cover - Cover used by animals to ameliorate the chilling effects of winter weather or the heating effects of summer weather. For elk, a stand of coniferous trees 40 feet or taller with an average crown closure of 70 percent or more.

Threatened Species - Any species, plant or animal, which is likely to become an endangered species within the near future throughout all, or a significant portion, of its range. In accordance with the 1973 ESA, the Secretary of the Interior identifies endangered species.

Tiering - Refers to the elimination of repetitive discussions of the same issue by incorporating by reference the general discussion in an environmental impact statement of broader scope. For example, a project EA could be tiered to the Forest Plan EIS.

Travel Habitat - Habitat used by a wildlife species for daily or periodic movements between areas of higher-quality habitat. For example, for a lynx this would be the forested cover used while traveling between areas used for denning and that used for hunting.

Underburning - A fire that consumes surface fuels but not trees and large shrubs. See also Low Severity Fire and Stand Maintenance Fire.

Understory - The trees and other woody species which grow under a more or less continuous cover of branches and foliage formed collectively by the upper portion of adjacent trees and other woody growth.

Ungulate - A mammal with hooves.

Vegetative Screening - Vegetation (trees, shrubs, etc.) that ameliorates the visual effect of management activities adjacent to viewing areas (i.e. main roads).

Vegetative Succession - A phase in the gradual supplanting of one community of plants by another.

Viability - A viable animal or plant species is defined as consisting of self-sustaining populations that are well distributed throughout the specie's range. Self-sustaining populations are those that are sufficiently large, and have sufficient genetic diversity to display the array of life history strategies and forms that will provide for their persistence and adaptability in the planning area over time.

Visual Resource - The composite of basic terrain, geologic features, water features, vegetative patterns, and land use effects that typify a land unit and influence the visual appeal the unit may have for visitors.

Water Quality - The physical, chemical, and biological properties of water.

Water Yield - The runoff from a watershed, including groundwater outflow.

Watershed - The land area drained by a river system.

Water Erosion Prediction Project (WEPP) - A computer simulation that predicts soil erosion.

Wetland - Areas that under normal circumstances have hydrophytic vegetation, hydric soils, and wetland hydrology.

Wilderness - Federal land retaining its primeval character and influence without permanent improvements or human habitation as defined under the 1964 Wilderness Act. It is protected and managed so as to preserve its natural conditions, which (1) generally appear to have been affected primarily by forces of nature with the imprint of man's activity substantially unnoticeable; (2) has outstanding opportunities for solitude or a primitive and confined type of recreation; (3) has at least 5000 acres or is of sufficient size to make practical its preservation, enjoyment, and use in an unimpaired condition, and (4) may contain features of scientific, educational, scenic, or historical value as well as ecologic and geologic interest.

Wildfire - An unwanted wildland fire that requires a suppression response.

Wildland Fire - A non-structure fire, other than prescribed fire, that occurs in the wildland. Any fire originating from an unplanned ignition.

Wildland Urban Interface (WUI) - That line, area, or zone where structures and other human development meet or intermingles with undeveloped wildland or vegetative fuels.

Wind Dominated Fire - The power of the wind is greater than the power of the fire in influencing its behavior.

Windfirm - A tree (live or dead) or species of tree that is relatively resistant to being blown over by the wind.

Windthrow - A tree or stand of trees that have been blown over by the wind.

Winter Range - The areas available to and used by big game during the winter season. Must contain forage or browse to feed big game. Winter range areas tend to have a relatively low amount of snow cover which enables the animals to reach the forage.

Appendix 4

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Appendix 5

List of Preparers

Lynn Johnson	Wildlife
Ellen Sullivan	Elk Security
Jennifer Holifield	Sensitive Species
Pat Price	Riparian, Aquatic Habitat and Aquatic Species, Economics
John Gier	Soils
Laura Jungst	Hydrology
Megan Strom	Vegetation, Old Growth, PTES Plants, Invasive Species, Snags and Coarse Woody Debris
Warren Appelhans	Fire and Fuels, Air Quality
Nancy Anderson	Cultural Resources
Moira McKelvey	Team Leader, Writer/Editor, Recommended Wilderness, Wilderness Study Areas, Inventoried Roadless Areas
Marcy Butts	Scenic Resources
Trini Garrison	GIS mapping and analysis